

and eventually picks it out), while she cannot be taught to distinguish any of the others, I conclude that her failure in this respect is not due to any want of intelligence, but to some deficiency in her powers of colour-perception.

NOTES.

THE annual meeting for the election of Fellows of the Royal Society was held at the Society's rooms in Burlington House, on June 6, when the following gentlemen were elected:—John Aitken, Dr. Edward Ballard, Alfred Barnard Basset, Horace T. Brown, Latimer Clark, Prof. David Douglas Cunningham, Lazarus Fletcher, William Botting Hemsley, Charles Thomas Hudson, Prof. Thomas McKenny Hughes, Edward B. Poulton, Prof. William Johnson Sollas, Charles Todd, Herbert Tomlinson, Prof. Gerald F. Yeo.

THE statue of Le Verrier is to be unveiled in the court of the Paris Observatory on June 25.

HERR VICTOR APFELBECK, the entomologist, will shortly start, in behalf of the Bosnian Government, on a journey of research in Herzegovina. Last year he discovered in Southern Bosnia five new species of eyeless cave beetles, and his investigations excited much interest among entomologists.

ACCORDING to the *British Medical Journal*, the programme of the Leeds meeting of the British Medical Association in August next "is developing in such manner as to afford the ample promise of a meeting of great scientific as well as social interest, and one which will be worthy of the traditions of this great medical centre."

MR. JOHN FREDERICK LA TROBE BATEMAN, F.R.S., died on Monday morning at Moor Park, Farnham, at the age of seventy-nine, after a severe illness. Mr. Bateman was well known as the engineer who supplied Glasgow with water from Loch Katrine.

THE death of Eugen Ferdinand von Homeyer, the eminent ornithologist, is announced. He had been President of the Ornithological Society at Berlin, was the author of several works, and possessed the largest existing collection of European birds. He was born at Herdin, near Anklam, in 1809, and died at Stolp, in Prussia, on June 1.

INFORMATION has been received in Berlin of the death of Dr. Bernhard Weissenborn, the zoologist to the German Cameroons Expedition, from a fever contracted through the hardships of the work and the bad climate.]

GERMAN papers record the death of Dr. C. Jessen, the naturalist, formerly Professor at Greifswald, and lately at the Berlin University. He was sixty-eight years of age.

AT a meeting of the Royal Horticultural Society on Tuesday, a paper on orchids was read by Mr. H. Veitch. In the discussion which followed the reading of this paper, various speakers referred with regret to the death of Prof. Reichenbach, and to the strange provisions of his will, by which botanists of the present generation will be prevented from studying his fine collection of orchids. Mr. Thiselton Dyer invited those interested in the nomenclature of orchids to put themselves in communication with the Kew Herbarium, and it was stated that Messrs. Veitch and Sander could furnish many duplicates of the examples which were to be locked up under the will of Reichenbach. Sir T. Lawrence spoke of an orchid which had been in this country to his knowledge for fifty years.

THE June number of the *Kew Bulletin* opens with an instructive paper on Jamaica cogwood. This is one of the most valuable timber-trees in Jamaica, yet until recently its flowers and fruit had not been received in this country, so that, as the writer points out, the position of the plant in botanical classification had been left in doubt. Good herbarium specimens, including flowers and fruit, have lately been sent to Kew by Mr. W. Fawcett, Director of Public Gardens and Plantations in Jamaica; and from this material Prof. Oliver has determined the cogwood to be a species of *Zizyphus*, a genus not previously recorded from Jamaica. *Zizyphus* is the Jujube or Lotus genus of *Rhamnaceæ*, and the fruits of several species, such as *Z. vulgaris* and *Z. jujuba*, have an agreeable flavour, and are commonly eaten. Besides this paper, there are contributions on cocoa-nut coir from Lagos, a wheat pest in Cyprus, patchouli, P'u-êrh tea, and agricultural industries at the Gambia.

WE take the following from *Allen's Indian Mail*:—"The appointment of Mr. A. Hartless from the Royal Gardens, Kew, to fill the vacancy in the staff of the Botanic Gardens at Shippur has given much satisfaction. This gentleman is a first-class botanist, and will no doubt contribute hereafter many original and important observations on the flora of India."

IN addition to the papers announced to be read at the ordinary meeting of the Royal Meteorological Society on June 19, a communication will be made on the recent thunderstorms, and a number of photographs of lightning will be exhibited.

A VIOLENT shock of earthquake, accompanied by local subterranean rumblings, was felt at Brest on June 7 at a quarter past one o'clock, its direction being from north to south. The shock is said to have resembled the vibration caused by the firing of a gun of large calibre. On the same day a shock of earthquake was felt at New Bedford, in Massachusetts.

ON April 13 and 14 a volcanic eruption occurred on Oshima Island, Japan. It is said that upwards of 300 houses were destroyed, and that 170 persons were killed by being buried beneath the ruined buildings.

ACCORDING to the *Japan Weekly Mail*, an earthquake of a most unusual character was recorded at 2h. 7m. 41s. p.m., on Thursday, April 18, in the Seismological Observatory of the Imperial University, Tokio. The peculiarity lies, not in its violence, but in the extreme slowness of its oscillations. The beginning of the shock had all the characteristics of the ordinary earthquake, but gradually the motion augmented, until at a certain stage of the shock it reached 17 millimetres, but the ground swayed so gently that the house did not vibrate visibly, nor were the senses alive to it. It took from four to seven seconds to complete one oscillation—a most unusual phenomenon, and one never before noted in the Observatory. The motion was almost entirely confined to the horizontal plane, and mostly south to north, but there were a few vertical motions of equally slow periods. This state of things lasted for 10 minutes 36 seconds. Prof. West, of the Engineering College, observed the water in a small pond to oscillate gently from north to south. At one time the water-level fell about 2 inches on one side of the pond, and exposed the bank, while, a few seconds later, the water immersed it nearly to the same depth, exposing the opposite bank, and this process continued for a quarter of an hour. "Slow oscillations of this nature have been called earth-pulsations, and these usually take place where there is a destructive earthquake or a submarine disturbance going on at a great distance. Earth-pulsations are known to have caused slow oscillations of the water in lakes. From this fact it may not be unreasonable to conjecture that a terrestrial or submarine agitation of unusual

magnitude has taken place somewhere. The authorities of the Science College have sent to the Hydrographical Bureau of the Naval Department, asking for information as to the state of the tide and seas. It may be as well to remark that it is not certain whether the maximum motion of 17 millimetres, as given by the seismograph, is perfectly accurate, as it is very difficult to measure slow oscillation like this with absolute certainty." It is now known as a fact that Vries Island, outside Yokohama Bay, and possibly sixty miles off, was in a state of violent volcanic eruption.

THE Admiralty has published an interesting Report on the bore of the Tsien-Tang Kiang, by Captain W. U. Moore, of H.M.S. *Rambler*, as a fitting termination to a long series of tidal observations made on that vessel in Chinese waters. Scarcely anything was before known about this phenomenon, although it occurs twice a day, seventy miles from Shanghai. The bore was found to originate, not at the mouth of the river, as was expected, but twelve or fifteen miles outside it. Captain Moore states that the bore cannot be accurately described as a wave, there being no undulation, nor any depression after it has passed. It is divided into two branches, which join together four miles from Haining, making a continuous white line two miles in length. It shortly afterwards contracts in width, and increases in speed and height, rising 8 to 11 feet high, and travelling between 12 and 13 knots an hour. The three cutters employed in making the observations were at times in considerable danger, and the Hydrographer pays a high compliment to the skill with which the boats were brought safely out of their dangerous situation.

THE meteorological observations for the year 1888, made at the Rousdon Observatory, Devon, under the superintendence of Mr. Cuthbert E. Peek, have been published. They are a continuation of those issued last year. The instruments continue to perform to Mr. Peek's satisfaction, and have been regularly read by his assistant, Mr. C. Grover. The observatory is a second order station of the Royal Meteorological Society.

MR. THOMAS SCOTT, of the Scientific Department, Scottish Fishery Board, recently fertilized ripe ova of the common gurnard (*Trigla gurnardus*) with milt of the whiting (*Gadus merlangus*). Segmentation soon set in, and development proceeded for about a day and a half; but the ova then gradually sank, showing that death had supervened, this being attributed to an imperfect supply of fresh sea-water. An attempt to fertilize gurnard ova with milt of the common dab (*Pleuronectes limanda*) failed; but ova of the lemon sole (*P. microcephalus*) were successfully fertilized by milt of the same species, and floated buoyantly.

A SHARK 10 feet long and 4 feet in girth was caught on the morning of June 7, about twenty-four miles south-east of Ventnor by the mackerel nets of the smack *Pioneer*, of Brighton. It has three rows of teeth, and is supposed to be three years old.

TRACES of glacial action have been discovered on the Thomasberg, which is over 800 metres high, near St. Margarethen, in the Rosenthal in Carniola.

MESSRS. MACMILLAN AND CO. have issued a new edition of Prof. T. H. Core's "Questions on Stewart's Lessons in Elementary Physics." The late Prof. Balfour Stewart, writing of the first edition of this useful little volume, said that Prof. Core had made his questions "at once simple and suggestive, leading on in some cases to higher results, so as to encourage students to proceed with the subject."

ALL students of ethnology and anthropology will welcome the first number of *Veröffentlichungen* from the Berlin Museum für Völkerkunde. This periodical, which is clearly printed on

good paper, takes the place of the *Original-Mittheilungen aus der Ethnologischen Abtheilung der Königlichen Museen*. The first number consists of plates illustrating American antiquities, with full descriptions and explanations. In some instances analogous objects from other parts of the world are represented along with those from America. The text is by Dr. Uhle, and Dr. Bastian contributes a brief prefatory note.

AN interesting paper on Palæolithic man in America, by Mr. W. J. McGee, of the United States Geological Survey, has been reprinted from the *Popular Science Monthly*. Mr. McGee holds that there is definite and cumulative evidence of man's existence in America during the latest ice epoch, with a strong presumption against an earlier origin than the first Quaternary ice-invasion; and that the primitive American "haunted the ice front rather than the fertile plain, and must have been hunter or fisherman."

AMONG the antiquities recently acquired by the Christiania Museum are some from the middle Iron Age, found in two barrows at Larvik. They consist of fragments of a lance, a shield with iron handle, a pair of shears or scissors, and a buckle of silver, besides a number of vessels, among which the most remarkable is a glass beaker, ornamented with threads of glass fused on to the exterior, a wooden bucket caulked with tar, and many urns. Among the latter is a large handsome one with a long neck. The graves in the barrows were made of stones. On a farm in the parish of Tjölling, also on the west coast of the Christianiafjord, a barrow, which had been formerly disturbed, has been excavated. Round it is a ring of raised stones. It dates from the early Iron Age. On the eastern and western side a *Bautasten*, or memorial stone, is raised. The funeral chamber is built of stone. Only three buckles of bronze, with silver ornaments, a plain ring made from an alloy of gold and silver, and the jaw-bone of a man with teeth remaining, were found. The body had not been burned. A yard further to the east a grave with calcined human remains was also found.

THE fourth issue of the *Jahrbuch der Naturwissenschaften* has just made its appearance. It is published by the Herderschen Verlagshandlung at Freiburg im Breisgau, and it remains under the editorship of Dr. Max Wildermann. It contains about 570 octavo pages, with an introduction. The subdivisions are under the control of different competent authorities. The section on physics occupies seventy-six pages, and is under the care of the editor; chemistry, with forty-six pages, and several sub-heads, under that of Dr. Hovestadt; applied mechanics, forty-six pages, under Dr. van Muyden; astronomy, thirty pages, under Dr. Franz; meteorology, under Dr. Pernter, forty-four pages; zoology, under three different editors, thirty-two pages; and similarly with botany, forestry, and agriculture, mineralogy and geology, anthropology, physiology, medicine and sanitary matters, geography, and ethnography. An appendix contains obituaries of eminent scientific men, and a report of the proceedings of the sixty-fourth meeting of the Association of German Naturalists and Physicians.

NAPHTHA is now much used as fuel in Middle Russia. Last year, 880,000 tons of it were sent up the Volga for fuel purposes; and it is expected that the export for the same purpose will this year reach no less than one million tons.

THE province of St. Petersburg is very rich in marshes covered with a thick carpet of vegetation, which conceals water to the depth of several feet—sometimes 25 feet and more. Small lakes and branches of rivers are continually being transformed into such marshes, and M. Tanfilieff, who has studied the way in which the transformation goes on, comes to the following conclusions (*Mémoires* of the St. Petersburg Society of Naturalists, vol. xix.). The pioneers of the transformation of a lake into

a marsh invariably are flowering plants, such as *Menyanthes*, *Comarum*, *Cicuta*, *Equisetum*, *Carices*, and the like. Their roots and underground stems make a thickly-woven floating carpet, which soon totally conceals the water. The *Sphagnum* invades this floating carpet, while the water beneath becomes filled with *débris* of decaying plants, transformed later on into peat-bog. In shallow basins the transformation goes on at a much speedier rate, as their bottoms are invaded by plants like *Phragmites* and *Scirpus lacustris* which reach a considerable height, and thus supply, after their decay, a good deal of additional material for the filling up of the basin. A mass of smaller plants, such as *Lemna*, *Hydrocharis*, *Callitriche*, *Utricularia*, *Hypnum fluitans*, and several others, usually grow also amidst the rushes. Of course, the streamlets which flow into the basin contribute also to fill it up by bringing in sand and loam. As soon as the floating carpet has reached a certain thickness, and the *Sphagnum* has still more increased its bulk, various plants, such as *Drosera*, *Vaccinium*, *Eriophorum*, the dwarf birch, and other bushes, begin to grow upon it, although the space beneath still remains filled with water. As the *Sphagnum* does not grow upon ponds containing a chalky water, its place in such ponds is mostly taken by the *Hypnum*, and in these cases a variety of other plants, such as *Typha*, *Stratiotes*, *Butomus*, *Ranunculus divaricatus*, and *Chara fragilis*, make their appearance. As to the *Sphagnum*, it invades wet meadows as well.

AT a recent meeting of the French Academy of Sciences, M. de Malarce, speaking of the extension of the metric system of weights and measures, gave some interesting figures. In 1887 the aggregate population of the countries in which the metric system was compulsory was over 302,000,000, being an increase of 53,000,000 in ten years. In 1887, in countries with a population of close on 97,000,000, the use of the system was optional; and the countries where the metric system is legally admitted in principle and partially applied (as in Russia, Turkey, and British India) had in 1887 a population of 395,000,000, being an increase of 54,000,000 in ten years. The increase is due to the growth of population in the countries which had already adopted the system, and to its adoption by new countries. The systems of China, Japan, and Mexico, are decimal, but not metric. The metric system is thus legally recognized by 794,000,000 of people, and the three last-named countries have a population of about 474,000,000. So that only about 42,000,000 of inhabitants of the civilized world have systems which are neither metric nor decimal.

SIR ARTHUR NICOLSON, the British Consul at Buda-Pesth, in his last Report on Hungary, referring to technical education in that country, says that it will afford an indication of the attention which is being paid to this important question to instance the steps which have been taken in Buda-Pesth in regard to primary technical education. By paragraph 80 of the Trade Law of 1884, every *commune*, where there are fifty or more apprentices, is bound to provide for their education, and to afford special courses of instruction. The apprentice schools in Buda-Pesth contain a preparatory class, provide a course of three years, and are chiefly destined to educate apprentices for the higher trade schools. Each district of the town must have at least one apprentice school. No class is to comprise more than fifty pupils, or at most sixty pupils; and should the number of pupils be larger, parallel classes can be established. A pupil passes at the end of each year into a higher class if he can show proficiency and good progress. Theoretical instruction is given six hours in the week, and drawing and modelling are taught five hours weekly, on Sundays. The first schools were established in 1887, and numbered 12 with 125 teachers. There were 42 classes, or, including the parallel classes, 93, attended by 5173 pupils. In 1888 the number of schools had risen to 16, the number of classes to 127, the staff of teachers 151, and the number of pupils to

6459. In the other towns and counties of Hungary there were 229 apprentice schools, with 1237 teachers, and 38,081 pupils. For all these schools, including those of the capital, the *communes* contribute in florins 214,302; private individuals, 1387; Chambers, 680; counties, 9080; State, 35,806; fees and fines, 129,488; making a total of 390,843 florins.

THE British Consul at Ancona, in his last Report, refers to a School of Practical Agriculture established in Fabriano in 1882. It is subsidized by the Government, the province of Ancona, the municipality of Fabriano, and the local Chamber of Commerce. The school has a Director, two Professors, and a Teacher of Practical Agriculture. The course of study is spread over three years as follows: first year, Italian, geography, elements of natural history, elementary arithmetic, agronomy, and writing; second year, Italian, geography, elements of natural philosophy and chemistry, agriculture, and rural accounts; third year, horticulture, rural direction and management of a farm, technical agriculture, and arithmetic. The school at present has thirty-six scholars, of whom nineteen are in the first year, nine in the second, and eight in the third. Of these, twelve are agriculturists, ten sons of land stewards, eleven sons of gentlemen, and three sons of tradesmen. The day's work begins at 5.30 a.m. in winter, and is over at 8 p.m. Seven hours are devoted to practical work, five to study, the remainder being allowed for meals and recreation. In summer the students rise at 4.30 a.m.; otherwise, with the exception of an extra hour and a half for recreation, the studies are carried on as in winter.

THE additions to the Zoological Society's Gardens during the past week include two Australian Thicknees (*Edicnemus grallarius*), an Eyton's Tree Duck (*Dendrocygna eytoni*) from Australia, two Lineated Parrakeets (*Bolborhynchus lineolatus*) from Mexico, two Senegal Touraours (*Corythaix persa*) from West Africa, purchased; two Elliot's Pheasants (*Phasianus ellioti* ♂ ♀) from China, deposited; a Hog Deer (*Cervus porcinus* ♀), two Mule Deer (*Cariacus macrotis* ♀ ♀), born in the Gardens.

OUR ASTRONOMICAL COLUMN.

STONYHURST COLLEGE OBSERVATORY.—The results of the observations made during the year 1888 at this Observatory have recently been published in the usual form. The bulk of the volume is occupied with the routine magnetic and meteorological observations, and an appendix gives the meteorological results for St. Ignatius College, Malta. The weather in 1888 was less favourable for the daily delineation of the solar surface than in 1887, but 223 full-sized drawings were secured. The daily areas of sun-spots derived from these show very strikingly, especially as given in graphical form, the nearness of our approach to minimum. The chromosphere was completely examined on eighty-four days, and partly on three other dates. The most important event of the year in connection with the Observatory has been the installation of a large grating-spectroscope for the especial purpose of photographing the solar spectrum, and the spectra of sun-spots in particular—a work which, in the present state of solar physics, greatly needed to be undertaken, and carried out with persevering regularity. The grating is a flat one, by Rowland, of 14,438 lines to the inch, and $3\frac{1}{2}$ inches in length. It is to be used in connection with a heliostat and a $5\frac{1}{2}$ -inch object-glass by Alvan Clark. The preliminary experiments promise well for its efficiency, and the Director of the Observatory is to be greatly congratulated on so valuable an addition to his equipment.

The Rev. E. Colin, S.J., who spent the last year at Stonyhurst Observatory, has just been appointed Director of the French Government Observatory at Antananarivo.

ASTRONOMICAL PHENOMENA FOR THE WEEK 1889 JUNE 16-22.

(FOR the reckoning of time the civil day, commencing at Greenwich mean midnight, counting the hours on to 24, is here employed.)